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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/486,882	03/02/2000	DUNCAN MCGREGOR	1015-00	3081

7590 05/17/2002

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EXAMINER	
TIZIO, STEVEN C	
ART UNIT	**PAPER NUMBER**
1627	

DATE MAILED: 05/17/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/486,882	MCGREGOR, DUNCAN	
	Examiner	Art Unit	
	Steven C Tizio	1627	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 March 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) *11-23* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *4* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

Detailed Action

Please note change in Examiner

1. **Claims 1-23** are currently pending.

2. Applicant's election without traverse of Group I (**claims 1-10**) in Paper No. 16 is acknowledged.

3. **Claims 11-23** are withdrawn from further consideration by the examiner, 37 CFR 1.142(b) as being drawn to a non-elected invention. Election was made **without** traverse in Paper No.16.

4. The Information Disclosure Statement has been entered on July 14, 2000, and has been fully considered on May 7, 2002.

5. The Supplemental Information Disclosure Statement has been entered on March 9, 2001, and has not been considered because the references are missing. Examiner requests the complete references in order to examiner the Supplemental Information Disclosure Statement.

6. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is

requested in correcting any errors of which applicant may become aware in the specification.

7. The disclosure is objected to because of the following informalities: throughout the specification the term "oestrogen" is used. Is oestrogen different from "estrogen"?

Appropriate correction is required.

8. This application has been filed with informal drawings. Applicant is invited to notice that the draftsman in PTO 948 checked boxes 5, 10, and 12. If applicant renumbers the figures, applicant is encouraged to amend the specification so that the description of renumbered figures corresponds to the renumbered figures.

9. This application does not contain an abstract of the disclosure as required by 37 CFR 1.72(b). An abstract on a separate sheet is required.

10. **Claims 1-10** are currently being examined in this application.

Claim Rejections - 35 USC § 112

11. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

12. **Claims 1-10** are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a peptide display carrier package (PDCP) in which the nucleotide-binding portion is a DNA binding domain of an estrogen receptor does not reasonably provide enablement for **all** peptide display carrier packages that express **any** nucleic acid binding portions of a peptide and using **any** peptide display system. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to practice the invention commensurate in scope with these claims. According to page 16 of the specification, "the oestrogen receptor is especially referred to ... is a large multifunctional polypeptide of 595 amino acids which functions in the cytoplasm and nucleus of eukaryotic cells... a minimal high affinity DNA binding domain (DBD) has been defined between amino acids 176 and 282 ... the functioning of this domain (i.e. DNA binding) is not inhibited by the presence of non-DNA binding domains at both the N and C terminal ends of this domain, in the full length protein. Based on the specification, this peptide display carrier package can only be used with the oestrogen receptor or a similar "nuclear steroid" receptor.

There are many factors to be considered when determining whether there is sufficient evidence to support a determination that a disclosure does not satisfy the enablement requirement and whether any necessary experimentation is "undue." These factors include, but are not limited to:

(1) the breadth of the claims;
(2) the nature of the invention;
(3) the state of the prior art;

(4) the level of one of ordinary skill;
(5) the level of predictability in the art;
(6) the amount of direction provided by the inventor;
(7) the existence of working examples; and
(8) the quantity of experimentation needed to make or use the invention based on the content of the disclosure.

See *In re Wands*, 858 F.2d 731, 737, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988).

(1-2) The breath of the claims and the nature of the invention: The claims are drawn to a peptide display carrier system that contains a recombinant polynucleotide and a chimeric protein that can have a nucleotide-binding portion and a target peptide portion. The claimed invention is very broad in that there are many different combinations of nucleotide-binding sites, expression systems, target peptides, and peptide libraries. The specification discloses that the recombinant DNA encodes the chimeric protein to which it is linked. However, the instant claims do not recite what the recombinant nucleic acid consists of. Does it encode a portion of the chimeric protein and if so, which portion? Since the specification only discloses a peptide display carrier package using the estrogen nucleotide-binding site, and gives examples of three selection systems (i.e. the human immunoglobulin kappa light chain antigen, the C-terminal fragment of human N-cadherin, and the human proprionyl CoA carboxylase), the claimed invention is of a general nature.

(3 and 5) The state of the prior art and the level or predictability in the art: Due to the general nature of the invention, there are many variables to consider before using the

disclosed invention. There are many receptor gene products available for screening in addition to the oestrogen receptor. It is not possible to predict the scope in which this invention will be used. In the absence of sufficient teachings in the specification, one of ordinary skill in the art would require undue experimentation to use this system to screen nucleotide libraries for **all** sequences that encode **all** peptides of interest.

(4 and 8) The level of one of ordinary skill and the quantity of experimentation needed to make or use the invention based on the content of the disclosure: The level of skill would be high, most likely at the Ph.D. level or one with skills in both recombinant DNA technology and molecular biology screening techniques (i.e. ELISA). Such persons of ordinary skill in this art, given its unpredictability, would have to engage in undue (non-routine) experimentation to carry out the invention as claimed. Due to the broad nature of the claimed invention and the many variables available to use the claimed invention, one skilled in the art would have to use a trial and error method to practice the claimed invention. Note that there must be sufficient disclosure, either through illustrative examples or terminology, to teach those of ordinary skill how to make and use the invention as broadly as it is claimed. Therefore, it is deemed that further research of an unpredictable nature would be necessary to make or use the invention as claimed. Thus, due to the inadequacies of the instant disclosure, one of ordinary skill would not have a reasonable expectation of success and the practice of the full scope of the invention would require undue experimentation.

(6-7) The amount of direction provided by the inventor and the existence of working examples: Applicants have not provided how to use their chimeric binding peptide library screening method for peptides other than the peptides recognized by the oestrogen receptor and the applicants have only given three examples of target/selection systems (i.e. the human immunoglobulin kappa light chain antigen, the C-terminal fragment of human N-cadherin, and the human proprionyl CoA carboxylase) in the disclosure. The claimed invention is very broad and does not give adequate direction to one skilled in the art to utilize the claimed invention as stated.

13. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

14. **Claims 1 and 2** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

(1) The term "*peptide display carrier package* (PDCP)" in **claim 1** is vague and indefinite. It is unclear as to what is meant by a "*peptide display carrier package*". Is the PDCP a bacterial cell or a phage particle (i.e. as used in phage display screening methods)? Applicants are requested to clarify.

(2) The term, "*chimeric protein-encoding portion of the recombinant polynucleotide*" in **claim 1** is vague and indefinite. Does the gene that codes for

the chimeric protein (located on the recombinant polynucleotide) also bind to its gene product (the protein-encoding portion of the chimeric protein)? What is the recombinant polynucleotide? Is it a vector, ssDNA, dsDNA, viral genome? Applicants are requested to clarify.

(3) The term, "*non-sequence specific protein*" in **claim 3** is vague and indefinite. The identity of this protein is unclear. Can any protein bind to the chimeric protein-encoding portion of the recombinant polynucleotide? Applicants are requested to clarify.

Claim Rejections - 35 USC § 102

15. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

16. **Claims 1, 5-6, and 9** are rejected under 35 U.S.C. 102(b) as being anticpated by Schatz *et al.* (US Patent 5,498,530, 3/12/96, provided by applicant in IDS filed on 7/14/00).

The instant claims disclose a peptide display carrier package (PDCP) that contains a recombinant polynucleotide and a chimeric protein with a nucleotide-binding portion and a target peptide portion. The recombinant polynucleotide binds to the nucleotide-binding portion of the chimeric peptide and another peptide binds to the recombinant polynucleotide that does not bind to the chimeric protein.

Schatz et al. anticipate **claim 1** of the claimed invention in column 2, lines 36-64, "the peptide is fused to a DNA binding protein. The peptide library is constructed so that the DNA binding protein can bind to the recombinant DNA expression vector that encodes the fusion product that contains the peptide of interest . . . inserting into the coding sequence of the DNA binding protein in the vector . . . a coding sequence for a peptide such that the resulting vector encodes a fusion protein composed of DNA binding protein and the peptide". Schatz *et al.* further anticipates the protection of the nucleotide-binding portion by a binding moiety in column 2, lines 55-56, "the fusion protein remains bound to the vector that encodes the fusion protein."

Claims 5 and 6 are anticipated by Schatz *et al.* in column 15, lines 54-58, and column 16, lines 44-57, "While in some instances it may be appropriate to synthesize peptides having contiguous variable regions to bind certain receptors, in other cases it may be desirable to provide peptides having two or more regions of diversity separated by *spacer residues* ("linker sequence") ... the present invention can be used to construct improved spacer molecules ..."

Claim 9 is anticipated by Schatz *et al.* in column 21, lines 32-36, "The random peptides of the present libraries can be displayed with a *free carboxy terminus* instead

of being displayed at the *amino terminus* or internal to the carrier protein and so add diversity to the peptide structures available for receptor binding."

Conclusion

17. No claims are allowed.

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven Tizio whose telephone number is (703) 305-1903. The examiner can normally be reached on Monday through Friday from 8:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jyothsna Venkat, can be reached at (703) 308-2439. The fax phone number for the organization where this application or proceeding is assigned is (703) 305-3014.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0196.

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PADMASHRI PONNALURI
PRIMARY EXAMINER